26 00 00 • ELECTRICAL

SECTION INCLUDES

Electrical Service
Standby Generators
Wiring and Panel Boxes
Interior Lighting
Exterior Lighting
Emergency Egress Lighting

RELATED SECTIONS

06 20 00	Rough Carpentry
08 70 00	Hardware
09 25 00	Gypsum Drywall
09 90 00	Painting
22 00 00	Plumbing
23 00 00	HVAC

The following Sections should be included as part of Section 26 00 00 when you have a project that has both electrical work and Electronic Safety equipment. Should the Work just be, for example, Fire Alarm Work then it can be bid as section 28 00 00.

28 00 00	Electronic Safety Equipment – including Fire Alarm (Smoke & Carbon Monoxide Detectors) Telephone Cable TV Intercom

Filed Sub Bid

M.G.L. c.149 §44F

Electrical is a stipulated filed sub-bid category under M.G.L. Chapter 149, §44F. If the project total cost is $100,000.00 or greater and the cumulative estimated value of the work in this section exceeds $20,000, it triggers the filed sub-bid requirement.

For Contracts estimated over $100,000 that are predominately Electrical Work the DCAM category for the General Contractor should be Electrical.

TECHNICAL STANDARDS

LAWS, ORDINANCES, AND CODES

All materials furnished and all work installed shall comply with the rules and recommendations of:

- ❑ MA Electrical Code (MEC)
- ❑ National Board of Fire Underwriters
- ❑ Local Utility Company
- ❑ All State, Local, Town, City or County Departments having jurisdiction

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ELECTRICAL SERVICE

DESIGN

Coordinate the design with the local utility company prior to finalizing bidding documents. Check with the local utility to determine whether pole or pad-mounted transformers are preferred and determine the concrete encasement requirements.

Underground wiring and pad-mounted transformers are recommended for electrical service, if economically feasible. Underground Service is preferred mainly for appearance considerations. It may be possible to have overhead service to the site with underground distribution to buildings.

Evaluate the service connection for capacity and reuse.

Where three-phase equipment is installed, e.g. septic system pumps, etc, confirm that three-phase power is available on-site.

If residents will *not* be paying for their own electric consumption, the site should be centrally metered to take full advantage of the utility company time of use rates.

Consult with the LHA to determine whether there is a likelihood in the near future that the residents will be individually billed for electricity. If that is the case, consider adding empty meter sockets.

During design the consultant shall contact the electric utility to inform them of the impending electrical work and determine whether any utility primary side work is anticipated.

EXECUTION

The Contractor is responsible for coordination of utilities, including installation and scheduling. Coordinate Contract Documents accordingly.

All local utility connection fees should be billed to the housing authority which will pay the utilities directly. Backcharges should not be included in the bid.

Provide spare conduit where utilities cross roads and paving to make future installation easier.

STANDBY GENERATORS

Provide a standby generator where required by the building code. The standby generator may be powered by natural gas with the approval of the local authority only. In addition the mandatory loads to be carried by the generator per code, the consultant may include a few receptacles on each floor to support the residents' medical equipment and AC in the community room. Consult with the LHA to determine if there are any other special needs.

Avoid oversizing the standby generator.

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WIRING & PANEL BOXES

DESIGN

Unit load calculations should consider at least two window air conditioners per apartment. A separately circuited (120v, 20 amp) air conditioner receptacle should be provided in the living room and master bedroom. The receptacles should be in addition to the receptacles required by code

Mounting heights:

- ❑ Wall Receptacles 24" AFF (except @ kitchen counters)
- ❑ Light Switches 42" AFF
- ❑ Thermostats, etc. 54" Max AFF to top of dials

For Kitchen and Bath upgrade projects confirm that the unit loadcenter does not require replacement due to the need for additional circuits or lack of accessibility.

In most bathroom applications bathroom exhaust fans shall be run intermittently. The bathroom lights and exhaust fan shall be controlled by a single switch. The switch shall be a time delay switch that when turned off allows the fan to continue to operate for a field adjusted period of time.

In some bathroom applications where high humidity may be a problem, design alternates such as continuous bathroom fan operation, or humidistat controls should be evaluated.

If there are no bathroom fans, provide one (less than 2 sones). Avoid fans that can be unplugged inside the fan unit by the residents.

Where new electric baseboard is installed, baseboard should not be located below wall receptacles per the MEC and do not locate electric baseboard under toilet tanks.

Evaluate the existing construction features of the building to determine whether wires can be fished in walls and ceilings. Determine whether there is strapping in the ceilings, block walls, fire blocking in walls, blown-in insulation in the attics, etc. These are all factors that impact the contractor's ability to run wires in the building. Selective demolition by an electrical contractor may be required to determine feasibility to fish wire in building.

Determine whether underground wires are direct buried or installed in conduit.

MATERIALS

Aluminum wire should only be considered for use for site power distribution if recommended by the local electrical utility.

Use copper wiring within buildings; aluminum is not acceptable even if it is permitted by code.
Main panel boxes must be lockable.

Panelboard bus bars shall be copper.

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All unit loadcenters shall meet the accessibility requirements of the Massachusetts Electrical Code. When new unit loadcenters are being installed, the minimum size should be 100 amp. New loadcenters should have spare poles in accordance with the MEC.

Unit loadcenters shall have Arc Fault Circuit Interruption (AFCI) breakers for bedroom circuits. Where AFCI breakers are to be installed in older existing panels, confirm AFCI breaker will fit in existing panels during Construction Document preparation.

Federal Pacific Electric Co. (FPE) panels are no longer manufactured and replacement breakers are difficult to obtain. FPE panels also have a history of problems. If FPE panels are in use at an LHA, assess whether these panels should be replaced based on the LHA's experience with these panels and whether additional breakers are to be added to the existing FPE panels.

Run site electrical lines underground in PVC conduit. Encase underground conduit in concrete as required by MEC.

Electrical manholes should be kept to a minimum.

When working with or replacing light fixtures as part of a modernization project, for example, residing, bath modernization or fire alarm system upgrades, check wiring to existing fixtures. Insulation around wires may be old and brittle and could create problems when an electrician tries to rework the wires.

For residing projects, review the exterior electrical equipment, i.e. meters, disconnects, etc. to determine whether they are suitable and can be reused or should be replaced.

Wire mold installations in family housing must have vandalism abuse considerations

INTERIOR LIGHTING

DESIGN

Install a bathroom light fixture on the wall or medicine cabinet above the bathroom sink.

Avoid wall-mounted fixtures except for fixtures above the bathroom sink.

Verify that sheet rock walls and ceilings and popcorn type ceilings do not have asbestos containing joint compound.

Energy Star fixtures which accept screw-based lamps are preferred. Avoid fixtures that require lamps with specialized bases

Lighting levels especially in kitchens and baths should not be less than existing and should be improved above existing if needed. Measure existing lighting levels.

INTERIOR LIGHTING, CONT

MATERIALS

Recessed lights, track lights, and incandescent lamped fixtures are not recommended. Recessed lights may be considered in certain applications such as above kitchen counters or sinks, etc.

Consult with Housing Authority on lamp and ballast preferences.

Consider light fixtures with plastic globes to minimize breakage.

Provide economical residential fixtures suitable for public housing

Install switched receptacles or switched ceiling lights in bedrooms.

In kitchens, provide full spectrum fluorescent lamped fixtures with high quality, energy efficient electronic ballasts, in addition to fluorescent task lighting above the sink.

In bathrooms, provide a full spectrum fluorescent lamped fixture with a high quality, energy efficient electronic ballasts.

EXTERIOR LIGHTING

DESIGN

Provide a site lighting map showing proposed point-by-point lighting levels.

Design exterior lighting to avoid excessive contrast. The Illuminating Engineering Society (IES) www.iesna.org maximum/minimum ratio should be 1:3.

MATERIALS

Site exterior lighting should have underground wiring, suitable poles, and light fixtures.

Specify fixtures with shielded lamps to prevent glare to adjoining property and night sky.

Photo cells dusk to dawn are recommended.

EMERGENCY EGRESS LIGHTING

MATERIALS

For emergency egress lighting, the following options are acceptable:

- ❑ Headlamps on battery
- ❑ Recessed "butter dishes" with remote battery
- ❑ Converted PL fixture with emergency ballast
- ❑ Floor fixture

All Exit Signs must be Illuminated.